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1.1 Communicable diseases - T.B., COVID-19.

These can be prevented by taking vaccine and managing safe distance from the infected persons.

1.2 Rashtriya Kishore Swasthya Karyakram (RKSK) was launched with the objective of monitoring & fulfilling the nutritional needs of adolescents.

1.3 Insurance schemes by central government -

① Ayushman Bharat

② PM Suraksha Bima Yojna

1.4 National Centre for disease control is responsible for monitoring & controlling the communicable diseases in the country. It works under the Ministry of Health & Family Welfare.

1.5 Green Revolution's success was marked by excessive use of synthetic fertilizers which later led to degradation of soil health & ground water resources. This diverted people towards organic & green farming.

1.6 The seasons are -

- Low literacy rate among farmers.
- Underdeveloped rural regions.
- Lack of scientific agriculture.
- Small land holding size.

1.7 Ease of doing Business Report is released by World Bank. It provides for conducive environment available in various countries for businesses to develop & flourish. It is based on various factors such as govt policies, tax regime, logistics, etc. India ranked 37th in 2022's Report.

1.8 DRDO was established in 1953. It is India's premiere scientific ~~research~~ research & development agency. It is headquartered in Delhi.

1.9 Uses of AI -

- In medicine & health sector. (Nanobots used in cancer treatment)
- In robotics & space mission (ISRO's humanoid Vyommitra)
- In e-commerce (Amazon's Alexa)

1.10 Intellectual property rights are governed through various laws in India. These are Geographical Indication Act, 2001; Patent Act, 1970; etc. These are aligned with the TRIPS agreement of WTO.

1.11 Constitutional provision related to environment protection -

- ① Article 48A of Directive Principles of State Policy (DPSP - Part IV). It provides for state to protect environment & wild life.
- ② Article 51A of Part IV A that is regarding Fundamental duties. It provides for the duty of citizens to protect the environment.

1.12 Antrix Corporation Ltd is a government undertaking which comes under Department of space under PMD. It works as a commercial wing of ISRO which is responsible for marketing of ISRO's space products in the market.

1.13 Immediate future plans of ISRO -

- ① Chandrayan 3 (2023) - Moon Mission
- ② Aditya L1 → Solar Exploration Mission
- ③ Shukrayan → Venus Exploration Mission

1.14 It is located in Dehradun, Uttarakhand. It is leading institute in Remote sensing studies. It comes under ISRO.

1.15 Achievements of Chandrayan-2 :

- ① It discovered traces of water on moon.
- ② It included India in the countries which explored moon.

2.1 National vaccination programme is nationwide vaccination programme. It was started in 1978 as Expanded vaccination programme as per the guidelines of WHO. It was focused upon immunization of newborns & children up to the age of 5 years. It was revamped in 1985 as Universal Immunization Programme. It included 12 vaccines of life-threatening diseases in infants & children. In 2014, Mission Indradhanush was launched to give new heights to this programme. Initially it covered 7 vaccines, which later increased to 12. Recently, (2022) Mission Indradhanush 4.0 has been launched focusing mainly on the left out children due to COVID Pandemic.

2.2 Health Organisation of Central Govt -

① National Health Authority - It works under ministry of health & family welfare. It is responsible for implementation of various health projects & schemes such as Ayushman Bharat, etc.

② Indian Council of Medical Research (ICMR) - It is the apex body to regulate the medical research in India.

③ National Pharmaceutical Pricing Authority (NPPA) - It is apex decision making body which decides & regulates the pharmaceutical products prices in the country. It comes under ministry of Chemicals & fertilizers.

④ Central Drugs Standards Control Organization (CDSCO) - It is responsible for controlling of drug standards.

2.3 Indigenous technology are those technologies which are developed by a country within its own boundary & without taking any foreign help. Ex. Agni V Missile system.

Limitations of Indigenous technology -

- It may be cheaper but can be of inferior quality as local resources are used.
- It can be suitable for that country only which has developed it.
- It may involve high wastage which may lead to higher cost of production.
- It may not be at par with advanced state of the art weapon system of other developed countries.
- It may lack its export potential.

~~2.4~~

2.4

Indian Deep space Network is a network of ~~satellites~~ developed by Indian Space Research Organization (ISRO) to conduct deep space mission. Its main objective is to explore the possibilities of exploring deep space or far flung regions of space which are yet to be explored. It is bestowed with the responsibility of developing such ^{space} equipments which will facilitate the deep space exploration of ISRO in coming future.

2.5

- Uses of Biotechnology in Health & Medicines -
- It is used in curing genetic diseases through Gene Therapy.
 - It is used in treatment of Diabetes. The laboratory made artificial Insulin is an example of it.
 - Modern pathological tests such as ELISA Test, Reverse Transcription etc are possible because of biotechnology.
 - It is used in Cancer treatment.
 - Stem cell surgery of heart is possible because of biotechnology.

2.6

Dr. P. J. Abdul Kalam was India's 11th President. He dedicated his whole life towards science & research. He worked in ISRO as chief scientist & executed various projects. He was part of India's second Nuclear Test Pokharan II. He dreamt of making self reliant in missiles & initiated the Integrated Missile Development Programme. Under this various missiles have been developed such as Agni, Prithvi, Nag, Trishul etc. He is also known as 'Missile Man' of India for his this contribution. He showed great affection towards children & motivated them to dream big & contribute in nation building. He wrote several books such as 'Wings of fire', 'Mission - 2020', 'Ignited Minds', etc.

2.7 Difference between Conventional & Non-Conventional sources of energy -

Conventional sources

- ① They are also known as non-renewable sources.
- ② They can not replenish once exhausted.
- ③ These include fossil fuels such as petroleum, coal, etc.
- ④ These are polluting in nature.
- ⑤ These are ^{found in} very limited locations.

Non-conventional sources

- ① They are known as renewable sources.
- ② They can be replenished ~~once~~.
- ③ These include wind energy, solar energy, etc.
- ④ These are not polluting.
- ⑤ These are found abundantly.

2.8

Causes of Environment degradation -

- Over exploitation of resources such as fossil fuels, ground water, etc.
- Excessive & unmindful industrial development leading to greenhouse emission & water pollution.
- Unscientific agriculture practices including excess use of fertilizers & pesticides leads to degradation soil profile & biota.
- Deforestation for expansion of industries.

Effects → Increasing concentration of greenhouse gases led to Ozone depletion.

- Eroded forest areas led to more incidents of human-crimal conflicts.
- Various health issues such as skin cancer, lung cancer etc.
- Ocean acidification which leads to mortality of ocean organisms such as corals, etc.

2.9

Environment education involves making people aware of environment protection & its impacts on human life. It is done through adding it to the school curriculum or otherwise. Government is running various campaigns with the help of various NGOs to spread the environmental education. It aims at making people aware of environment conservation, protection of natural resources & wild life, mindful use of conventional resources & promotes non-conventional resources of energy. The environment protection is directly related with human health. The environment degradation can have negatively impacts the human life hence environmental education is need of the hour.

2.10

According to Economic Survey - 2021, around 91% of farmers in India are small & marginal farmers. It means that they have landholdings below 2 hectare. The high population growth is the main reason behind it.

Solutions to this problem can be -

- Dedicated government policy to check population growth.
- Consolidation of lands through co-operative farming, which will be more remunerative.
- Role of FPOs (Farmer Producing Organisations) to increase the production.
- Contract farming with MNCs but closely regulated & monitored by the government.
- Involvement of NGOs for extension education for better farming practices.

3.1 AYUSH stands for Ayurveda, Yoga & Naturopathy, Unani, Siddha & Homeopathy.

The evolution of Ayurveda traces its history back to Rigvedic period. It finds its mention in Yajurveda. Yoga was popularized by Maharshi Patanjali. It involves various physical exercises & meditation. Unani system of medicines is inspired by the Greek medicinal system of ancient Greek. Siddha system was developed by Tamil saints to cure multiple diseases in ancient Dravidian culture. Homeopathy involves use of medicinal plants & herbs to cure the illness.

AYUSH system of medicines collectively involves use of organic & natural herbs to treat any illness. In this smaller doses of medicines are provided for a longer period of time to see the desired result.

Challenges associated

- Lack of mainstreaming of AYUSH system of medicines.
- Dominance of Allopathic medicines in the market because of their advertisements done by big pharma companies.

- Lack of awareness among new generation regarding AYUSH medicines.
- Unscientific claims done by AYUSH practitioners in the past.
- Lack of Research & development in this field.

Prospects of AYUSH → Government of India has been taking various steps to revive & popularise AYUSH medicine system. These are —

- National AYUSH Mission → under this AYUSH system ~~is~~ is developed ~~at~~ to perform at par with the other medicines.
- Dedicated ~~A~~ separate Ministry as AYUSH Ministry to regulate this sector.
- Budget allocation for R&D in AYUSH medicinal system.
- Various advertisement campaign to ^{generate} awareness.
- Penetration of AYUSH Centre ~~at~~ to remote areas as well.
- Training of AYUSH Professionals & practitioners.

During the testing times of COVID Pandemic AYUSH practitioners worked did a commendable job in rural areas. All is needed to better implement the policies to make the AYUSH system equally efficient as the other medicinal systems.

3.2

In 1962, Indian Space National Committee for Space Research was established by the then government. Vikram Sarabhai contributed a major role in its foundation. Later in 1969, it was renamed as Indian Space Research Organization (ISRO). From its inception to till now it has launched various successful missions. ~~These~~ The evolution & achievements of ISRO can be seen through its missions. These missions include—

① Development of various launch vehicles such as ASLV, PSLV, GSLV, GSLV Mk III, etc.

② Development of Resource Satellite — This includes various earth observation satellite such as Bhaskara 1, Rohini, Resourcesat series, Oceansat series, Cartosat series, RISAT series, SARAL, Megha Tropiques, etc.

③ These satellites are used in resource localization, land use pattern mapping, ground water resource mapping, forest area calculation, etc.

- ③ Development of Communication Satellites - These include GSAT series, EduSAT, etc. These are used for telecommunication, weather forecasting, disaster warning, etc.
- ④ Navigation satellite - ISRO designed India's regional navigation system called Indian Regional Navigation Satellite System (IRNSS) or NAVIC that is Navigation in Indian Constellation. It is made on the similar lines of USA's GPS.
- ⑤ Educational purpose satellites - SWAYAM, SATYABHAMA, etc.
- ⑥ Other future missions -
- Aditya L1 → Solar mission (first) to study sun's corona (outer part)
 - Chandrayan 3 Mission → Moon mission to be launched in 2023.
 - Shukrayan mission → Venus exploration mission.

ISRO has successfully launched various missions which made its mark at global space platforms. These missions include Gagan Yan, Chandrayan 1 & 2, Mars Orbiter Mission (MOM), etc.

It has become one of the few space agencies in the world to perform exceptionally in the space missions & it brought India to the forefront of space exploring nations.

3.3. National awards in field of science-

- ① Shantiswaroop Bhatnagar Award
- ② SHASTRA Ramanujan award in field of mathematics.
- ③ CR RAO Award in mathematics
- ④ Padma Awards (Padma Vibhushan, Padma Bhushan, Padma Shree in field of science & research)
- ⑤ G.D. Birla Award

International Awards

- ① Noble Prize in field of science, physics, maths, chemistry, etc
- ② ~~Noble~~ Abel Prize in mathematics
- ③ Kalinga Prize by UNESCO

8.4 India has emerged as a front runner in environment protection. It has a sound history in making & implementing various environment protection policies & regulatory frameworks.

There are various laws & rules regarding environment protection. These are -

① Protection of Wildlife Act, 1972 -

It was enacted in 1972 in the wake of Stockholm Conference of 1972.

It has 6 schedules which gives varied degree of protection to wildlife according to their status of being endangered.

② Water (Protection & Control of Pollution) Act, 1974 - It was ~~launched~~ ^{enacted}

to ensure mindful use of water resources & check on water pollution. Central Board of water conservation comes under this.

③ Air (Protection & Control of Pollution) Act, 1981 → It regulates & monitors the ~~the~~ air quality & takes measures

to prevent air pollution.

④ Environment Protection Act, 1986 → It was enacted to give rehabilitation & compensation to the victims of Bhopal Gas Tragedy (1984). It was enforced in 1986. It ~~takes~~ ~~decides~~ the

⑤ National & Green Tribunal Act, 2010 → It closely monitors the Environment protection activities. It deals with the legal cases regarding environment pollution through its National Green Tribunal. It also imposes penalties on the environment polluters.

⑥ Forest Rights Act, 2006 → It recognizes the forest dwellers the land right over forests & thus protects the forests & communities living there.

⑦ Coastal Regulation Zone Rules, 2016 → These rules regulates the coastal areas by marking them as CRZ I, II, III etc on the basis of ^{allowed} developmental activities there.

It can be seen that through these legislations India has so far been able to conserve environment & wildlife.

3.5 India's Rocket launch ~~with~~ vehicle journey initiated in 1980s with the development of Small Launch Vehicle (SLV) in 1980 it successfully launched Rohini satellite in the ~~Geo~~ Low Earth Orbit.

The evolution of launch vehicles in India —

① Small Launch Vehicle (SLV) →

It was developed in 1980. Rohini satellite was launched through it.

② Augmented Satellite Launch Vehicle ~~or~~

(ASLV) → It was developed in 1988.

Its ~~was~~ payload capacity was three that of SLV.

③ Polar Satellite Launch Vehicle (PSLV)

It was developed in 1993. It had 4 ~~stages~~ liquid stages. It was first of its kind. Later its variants were developed as PSLV-G, PSLV-CA, PSLV-XL. Chandrayaan mission (2008) & Mars Orbiter Mission (2013) were launched through using PSLV.

④ Geosynchronous satellite by Launch vehicle
(GSLV) → Developed in 2001. It is a fourth generation 3 liquid stage launch vehicle. (MK II forms its 3rd stage)

⑤ GSLV MK III → It was developed to carry ~~upto~~ ^{class} 4 tons of satellite to Geosynchronous Transfer Orbit & 10 tons to Low earth orbit. CARE mission or Crew Module Atmospheric Re-entry Experiment mission was carried out by it (2014). Later it was used to launch Chandrayan-2 mission (2019)

Since the inception of ISRO it has made a magnificent development in Geostationary launch vehicles. With its latest developments it has reduced India's dependence on foreign space launch stations & helped India ~~space~~ emerge as a space front runner.